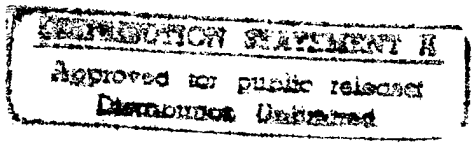
DATE: 3/20/97

CONTROLLING OFFICE FOR THIS DOCUMENT IS:
SIMULATION AND TECHNOLOGY DIVISION
DIRECTORATE FOR TECHNICAL MISSION
US ARMY TEST AND EVALUATION COMMAND
ABERDEEN PROVING GROUND, MARYLAND 21005-5055

POC: DR. C. DAVID BROWN (DIRECTOR)

DISTRIBUTION STATEMENT A: Public release

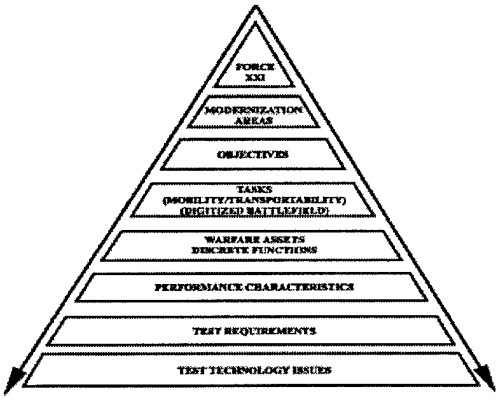


Challenge to the Tester: Force XXI Requires New Approach

by C. David Brown

Equipping the 21st century Army is a massive, Army-wide undertaking, as new technologies are inserted or retrofitted into our substantial equipment inventory. Every command is challenged to "reinvent itself" toward this goal. In this issue, we focus on the challenges - what new technologies present the greatest challenge to the tester, nd our plans for developing and acquiring test technologies consistent with emerging warfighting concepts and initiatives.

The Army staff is focused on the concept processes and design of the institutional Army and its sustaining base. The Army Deputy Chief of Staff for Operations and Plans (DCSOPS) is synchronizing these three axes to ensure a seamless link from the foxhole to the factory, efforts coordinated by the Louisiana Maneuvers Task Force.



The new "organizational changes," "ventures," and "thrusts" pointing at Force XXI indicate that the Army indeed intends to change its approach to its missions. Every organization will be affected; every organization must find its niche and pull its weight. The U.S. Army Test and Evaluation Command (TECOM) is reshaping its roles and mission to fit into the new picture and provide the necessary test and evaluation (T&E) services.
Its recent report "21st Century Test Technology Issues" breaks down the major modernization areas and identifies test technology needs. The letter from John Gehrig, Department of the Army's Director of the Test and Evaluation Management Agency, printed at the front of the report, provides an insightful overview of the Force XXI concept and the necessary information for planning by the testers. In the letter, Mr. Gehrig states,

"The Army tradition of providing the most advanced weapon systems and military equipment for use by the soldier/warfighter will be carried forward into the 21st century. The 21st century Army is forming right now.

"Force XXI weapons and equipment are and will continue to be state-of-the-art. New and improved systems, subsystems, and components will incorporate new and emerging technologies to achieve optimum operational suitability and flexibility.

"The Force XXI vision is one of swift, minimum-casualty victories in war and in other operations such as peace-keeping and peacemaking. The soldier will be part of an Army capable of short-notice, strategic deployment, followed by effective tactical employment. The Army will be operationally flexible and efficient. Computers will pervade every level of command structure. From the soldier in the field through echelons of command, information provided will be specifically tailored for the situation. Communications founded upon secure, reliable, integrated networks will be the cornerstone of successful battlefield warfare. To provide for this digitized Army, new and emerging technologies will be incorporated into existing and new production weapon systems and military equipment.

"Planning for and development of test-support equipment and instrumentation should be completed well before beginning of systems and equipment tests. In addition, the rule of thumb is that test instrumentation accuracy and fidelity are to be an order-of-magnitude more precise than the item being tested. However, test support systems technology development often lags advanced weapon systems technology development.

"I support this "21st Century Test Technology Issues" as a significant corroboration of the need for timely development of state-of-the-art equipment, instrumentation and facilities. The test technology issues identified provides a foundation for planning to meet future test support needs"

Testing Criteria Move Into the Next Century as Force XXI Challenges Testers to 'Reinvent ' the Field

Of course as testers, we strongly believe that successful development and fielding of new weapons and equipment is only made possible by incorporating a thorough testing program. At

the same time, we recognize that testing must be tailored to provide timely answers supporting major problem milestones. The pyramid showing Force XXI at the apex appropriately has "test technology issues" at the base. From this structure, TECOM are developing its plan to meet the challenge. Starting with the Force XXI concept and working down the pyramid - objectives, tasks, performance characteristics, test requirements - the process leads to definition of test support needs within the context of the eight test technology areas.

- **Information**: Data requirements to meet test objectives, data sensing, data transmission, data recording, data reduction, data processing, and data presentation.

- **Environment** (Generation): Providing manmade and natural phenomena
to ensure an environment appropriate to the test to be conducted; e.g., climate, weather, geography, tactical and logistics support, threat reproduction, and personnel training.

- **Targets and Threats**: Targets are vehicles or other equipment for
testing weapon systems (surface-to-air, air-to-air, surface-to-surface, air-to-surface, subsurface- to-subsurface) and for radar and electronic warfare systems testing. Targets may be used for testing subsystems such as radars and infrared-seeking components. Targets typically emulate enemy threats to our forces.

- **Characterization**: Description of test items physical appearance,
confirmation of conformance to specifications, and state of repair.

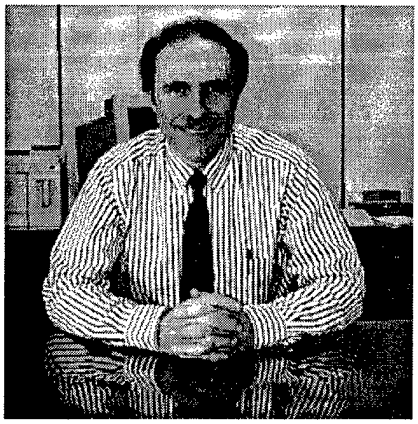
- **Statics**: Determination of forces acting on bodies in motion, which deals with terms "work, power, and energy."

- **Tracking**: Obtaining of accurate time, space, and position information (TSPI) of a test.

- **Scoring**: Determination of merit of a test evolution or test results.

- **Reporting**: Formal documentation of testing in progress or completed; e.g., interim, incident, quick-look, letter, firing, and final reports.

We intend to reinvent how we do business in each of eight test technology areas to respond to 21st century test challenges.



DR. C. David Brown

Dr. C. David Brown, Chief of TECOM's Simulation and Technology Division, began his TECOM career in 1975 as an Army captain, and won the Crozier Award in 1977 for his breakthrough work in videometrics. His accomplishments as a civilian include the design, construction, and validation of the Moving Target Simulator, "The Bubble." He holds bachelors and masters degree in electronic engineering, and a doctoral degree in electronic engineering, electro-optics and image processing from the University of Delaware. He has studied biomedical engineering and instrumentation at John Hopkins University.

---

[1] Dr. C. David Brown